

Integrated Sublimator Driven Coldplate for use in Active Thermal Control System, Phase II

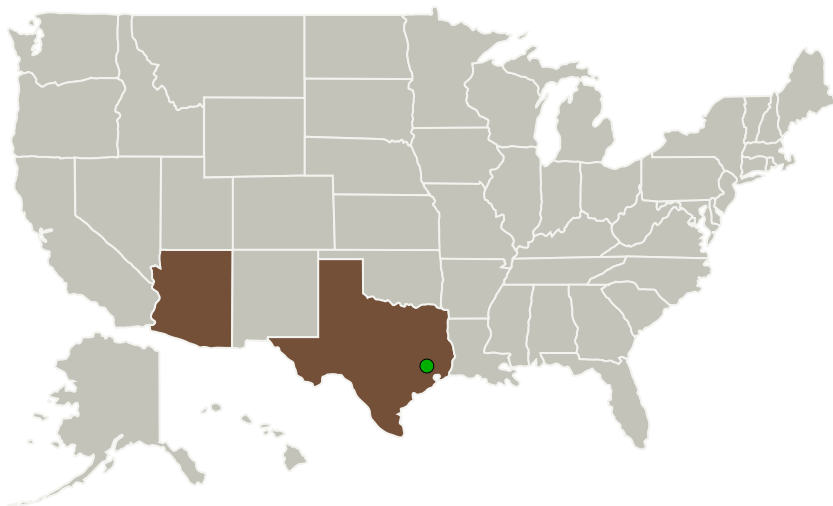
Completed Technology Project (2011 - 2014)



Project Introduction

The original Sublimator Driven Coldplate (SDC) design sought to provide significant mass savings over a traditional pumped fluid loop by combining the functions of a cold plate and a sublimator and eliminating the fluid loop (Leimkuehler, et. al., "Design of a Sublimator Driven Coldplate Development Unit," 2008-01-2169). The target application was to provide heat rejection for the ascent module of the Altair lunar lander vehicle during the lunar ascent mission phase. However, in order to provide heat rejection for the ascent module during the rest of the mission, it is desirable to keep the ascent module integrated with the fluid loop in the rest of the Altair vehicle. Therefore, we propose an Integrated Sublimator Driven Coldplate (ISDC) that can function as both a standard flow-through cold plate and a Sublimator Driven Coldplate. The ISDC builds on the original SDC concept by adding coolant layers so that it can be integrated with the pumped fluid loop on the rest of the vehicle. This approach provides mass savings by (1) combining multiple pieces of hardware into a single piece of hardware and (2) providing additional fault tolerance without the need for redundant hardware.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Paragon Space Development Corporation	Lead Organization	Industry	Tucson, Arizona
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Arizona	Texas

Project Transitions

**June 2011:** Project Start**September 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139013>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Paragon Space Development Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

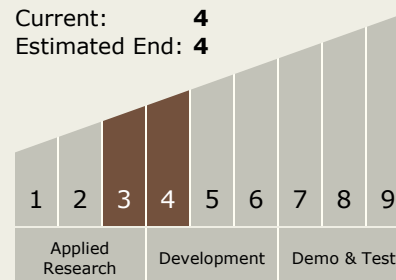
Program Manager:

Carlos Torrez

Principal Investigator:

Thomas Leimkuehler

Technology Maturity (TRL)

Start: **3**Current: **4**Estimated End: **4**

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Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.1 Heat Acquisition

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System